

Operative Hysteroscopy in a Jamaican Cohort

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ABSTRACT

Objective: The objective of this study is to determine the indications, success, and complications of operative hysteroscopy performed at The University of the West Indies (UWI).

Methods: A five-year retrospective cohort study was done of women undergoing operative hysteroscopy at the Hugh Wynter Fertility Management Unit (HWFMU) of the University of the West Indies from January 1, 2001 to December 31, 2005. The demographics of the patients, indications, complications of the procedure and postoperative follow-up were assessed. Patient's post-procedural quality of life was assessed by a questionnaire.

Results: During this period, 92 operative hysteroscopies were performed on 87 patients, with repeat procedures being performed in three patients. The mean age of patients undergoing operative hysteroscopy was 36.65 years with a range of 23 to 50 years. The main indications for operative hysteroscopy at the HWFMU were submucosal fibroids (50%), intrauterine synechiae (26%) and removal of an intrauterine contraceptive device (11%). There were four procedure-related complications, all of which occurred during myomectomy and required hospitalization.

Conclusion: Operative hysteroscopy is a safe and highly effective therapy for carefully selected women. As a consequence of technological advancements, an increasing number of gynaecological conditions, traditionally treated by laparotomy, can now be treated safely and effectively using outpatient operative hysteroscopy.

Keywords: Intrauterine adhesions, Jamaica, operative hysteroscopy, submucosal fibroids

Histeroscopia Operatoria en una Cohorte Jamaicana

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RESUMEN

Objetivo: El objetivo de este estudio es determinar las indicaciones, éxito, y complicaciones de las histeroscopías operatorias realizadas en la Universidad de West Indies (UWI).

Métodos: Se realizó un estudio de cohorte retrospectivo de cinco años con mujeres sometidas a Histeroscopia operatoria en la Unidad de Fertilidad "Hugo Wynter", en la Universidad de West Indies (HWFMU), del 1ero de enero de 2001 al 31 de diciembre de 2005. Se evaluaron los datos demográficos de los pacientes, así como las indicaciones, las complicaciones del procedimiento y el seguimiento post-operatorio. Se aplicó un cuestionario para evaluar la calidad de vida del paciente luego del procedimiento.

Resultados: Durante este período se realizaron 92 histeroscopías operatorias a 87 pacientes, repitiéndose los procedimientos en tres pacientes. La edad promedio de los pacientes sometidos a Histeroscopia operatoria fue 36.65 años, con una rango de 23 a 50 años. Las indicaciones principales para la histeroscopia operatoria en la Unidad HWFMU fueron los miomas submucosos (50%), las sinéquias intrauterinas (26%) y la extracción del dispositivo anticonceptivo intrauterino (11%). Hubo cuatro complicaciones relacionadas con los procedimientos, todas las cuales tuvieron lugar durante la miomectomía y requirieron hospitalización.

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Conclusión: *La histeroscopia operatoria es una terapia segura y altamente efectiva para mujeres cuidadosamente seleccionadas. Como consecuencia de los avances tecnológicos, un número creciente de condiciones ginecológicas, tradicionalmente tratadas mediante laparotomía, pueden ahora ser tratadas con seguridad y efectividad mediante histeroscopia operatoria ambulatoria.*

Palabras claves: Adherencias intrauterinas, Jamaica, histeroscopia operatoria, miomas submucosos

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INTRODUCTION

Operative hysteroscopy is now the gold standard for the treatment of most benign intrauterine pathologies (1). The procedure allows for surgery under direct visualization of the uterine cavity using a monitor, video camera system, light source, operating hysteroscope or resectoscope and distension media. Operative hysteroscopy was first performed at the Hugh Wynter Fertility Management Unit (HWFMU) in January 2001.

With marked improvements with instrumentation such as automated fluid management systems, gynaecologists have come to realize that the procedure is not only safe but is relatively easily mastered. To this end, many traditional, "more invasive" open procedures have been replaced by operative hysteroscopy. In most cases, these procedures can be safely and successfully performed in the ambulatory care setting with significant reduction of inpatient hospital stay and proven cost-effectiveness (1–3).

Operative hysteroscopy is indicated in women with: endometrial polyps, submucosal fibroids, intrauterine adhesions, Mullerian anomalies (*eg* uterine septum), retained intrauterine contraceptives or other foreign bodies, sterilization and endocervical lesions (4, 5).

Complications in hysteroscopy are directly related to the type of procedure, which can be categorized as entry-related, technique-related, media-related and postoperative complications (6). Entry-related complications include cervical lacerations, uterine perforation, and inability to dilate the cervix, haemorrhage and bowel or bladder injury. Technique-related complications include procedure-related hospital admissions, uterine perforation, haemorrhage and failure to perform the procedure due to poor patient selection. Media-related complications include gas (venous) embolism, excessive fluid absorption and hyponatraemia and its sequelae. Postoperative complications include endometritis, postoperative synechiae, haematometra, procedure failure and endometrial cancer (4, 6).

Contraindications to hysteroscopy are: viable intrauterine pregnancy, active pelvic infection (including genital herpes infection) and known cervical or uterine cancer (5).

This study aims to assess the efficacy, range of complications and to identify any limiting factors encountered during operative hysteroscopy. This study has been approved by the Faculty of Medical Sciences Ethics Committee, The University of the West Indies.

SUBJECTS AND METHOD

Between January 1, 2001 and December 31, 2005, a retrospective study was performed in consecutive patients who underwent operative hysteroscopy at the HWFMU. Each patient's hospital record was collected and the following data extracted: demographic data, indication for surgery, operative time, characteristics of the myomas (number, location and dimension), any intra-operative and postoperative complications, and length of hospital stay. All patients were included and there were no exclusion criteria. Success was determined by patient satisfaction or complete resolution of symptoms. Failure was recorded if a subsequent intervention was required or symptoms persisted.

Patients were contacted by telephone and consented verbally to participate in the post-procedural quality of life survey.

Instrumentation

At the HWFMU, we use an operative sheath with instruments inserted through channels and a continuous flow resectoscope (Karl-Storz, Tuttlingen, Germany). A standard high frequency generator (Conmed Sabre 180, Conmed Corporation, Utica, NY, USA) provided the cutting and coagulation current (cutting current was set at 80 watts of pure cutting current and coagulation at 30–40 watts). Hysteroscopic myomectomies were performed using the loop electrodes. A Hamou Endomat Fluid Monitoring system (Karl-Storz, Tuttlingen, Germany) set to a maximum flow rate of 150 ml/min, a maximum pressure of 100 mmHg and a suction pressure of -0.2 to -0.4 bar was used for the procedures. Cervical dilatation was accomplished primarily by pre-operative cervical ripening with misoprostol (Cytotec®, Searle, USA).

Distending media

Because the inside of the uterus is a potential cavity, like a collapsed balloon, it is necessary to distend it with either a liquid or a gas (carbon dioxide) in order to view. Hysteroscopy is therefore performed using a distending medium to provide a global view of the uterine cavity. The choice of fluid type depends on the type of equipment (monopolar or bipolar energy source). Non-electrolyte fluids are used with monopolar equipment and electrolyte fluids are used with bipolar energy equipments. At the HWFMU, we use 5% mannitol as the distending medium.

The data collected were subjected to statistical analysis using Statistical Package for Social Sciences (SPSS) Version 12.0. Descriptive statistics were used to analyse the data.

RESULTS

Over the five-year period, 92 operative hysteroscopies were performed on 87 patients, with repeat procedures being performed in three patients (two myomectomies and one adhesiolysis) after the initial surgery failed to achieve symptomatic relief. The mean age of patients undergoing operative hysteroscopy was 36.65 years with a range of 23 to 50 years. In this series, 69.7% of the patients were nulliparous with median parity of 0 with a range of 0–4 children.

Pretreatment of fibroids with a gonadotropin-releasing hormone (GnRH) analogue was done in seven cases (16.7%). In all cases cervical priming was performed with misoprostol. There was one (4.9%) failed attempt at dilatation due to a stenotic cervical canal.

Myomectomies, adhesiolysis, polypectomies, endometrial resection, removal of intrauterine contraceptive devices (IUCDs), metroplasty and the removal of bony metaplasia of the endometrium were the procedures performed. One patient who was diagnosed with an intrauterine septum on HSG turned out to have intrauterine synechiae and had adhesiolysis performed. Twenty-one (91.3%) of the patients

having adhesiolysis reported having had a prior dilatation and curettage. One patient with findings of a uterine septum had metroplasty performed. All IUCDs were successfully removed.

Table 1 outlines the frequencies, technique, operating times and complication rates of these procedures. There were four procedure-related complications, all of which occurred during myomectomy and required hospitalization. Three of these procedure-related complications resulted from fluid overload with all having fluid deficits in excess of 2 liters (Table 2). Mild hyponatraemia occurred in one case requiring diuretic therapy. The outcome was good in all three cases. The other procedure-related complication was due to haemorrhage. Entry-related complications (uterine perforation, cervical trauma) were not reported in this series.

Of the 87 patients, attempts were made to contact 79 who had a definitive procedure done. Of these 79 patients, 59.5% ($n = 47$) were contacted and consented verbally to participate in the post-procedural quality of life survey (Table 3). Reproductive and surgical outcomes are shown in Table 4.

DISCUSSION

The literature is replete with information on the benefits of operative hysteroscopy in patients afflicted with abnormal

Table 1: Mean operating time (minutes) and procedure-related complications

PROCEDURE	Procedure No (n = 92)	Technique	Mean operating time \pm SD	Range of operating times (minutes)	Success rate of surgery	Major complications
Myomectomy	46 (50%)	R	87.03 \pm 30.54	45.00 – 195.00	95.6%	4.34%
Adhesiolysis	24 (26%)	R, HS	72.72 \pm 14.20	55.00 – 105.00	100%	0
Metroplasty	1 (1%)	R	60.00 \pm *	60.00	100%	0
Polypectomy	9 (10)	R, HS	30.00 \pm 5.10	15.00 – 45.00	100%	0
Endometrial resection	1 (1%)	R	55.00 \pm *	55.00	100%	0
Removal of bony metaplasia	1 (1%)	R	–	–	100%	0
IUCD removal	10 (11%)	F	–	–	100%	0

HS = hysteroscopic scissors, R = resectoscope, F = semi-rigid forceps, IUCD = intrauterine contraceptive device

* Standard deviation not applicable for metroplasty and endometrial ablation as only 1 case existed in either category.

Table 2: Fluid deficit

Deficit	Frequency	Percentage
0–1000 ml	67	81.50%
1000–2000 ml	9	12.34%
> 2000 ml	1	1.23%

* Data not found for 4 procedures (4.03%)

uterine bleeding, dysmenorrhoea, uterine malformations, submucosal myomas, polyps, uterine synechiae, bony metaplasia of the endometrium and infertility (1–8).

The mean operating time for adhesiolysis (Table 1) was significantly longer ($p < 0.001$) in our series than that reported by Preutthipan in 2005 (9). This significant difference in operating time may be due to the rapid turnover of residents and the severity of the cases.

The mean time for polypectomy in the present series was comparable ($p > 0.05$) with the mean time reported in a

Table 3: Outcome of post-procedure quality of life survey: Post-procedure symptomatic outcome

Cases (n = 92)	No. of participants n = 47 (%)	No. menorrhagia improved (%)	No. dysmenorrhoea improved (%)	No. A/H resolved (%)	No change in menstrual flow	Satisfied	Dissatisfied	Unsure of satisfaction
Myomectomy n = 46	32 (76.2%)	18 (75%)	16 (50%)	0	6 (25%)	23 (71.9%)	7 (21.9%)	2 (6.2%)
Polypectomy n = 9	5 (55.6%)	1 (20%)	1 (25%)	0	4 (80%)	2 (40%)	3 (60%)	0
Adhesiolysis n = 24	12 (50%)	0	0	6 (60%)	6 (50%)	6 (50%)	4 (33.3%)	2 (16.7%)

Table 4: Reproductive and surgical outcome

Procedure (n = 92)	No. of participants (n = 47)	Infertility	Conceived	Live birth	Miscarriages	Repeat procedure	Hysterectomy
Myomectomy n = 46	32 (76.2%)	12	7 (58.3%)	6 (50%)	1 (8.3%)	2 (6.3%)	1 (3.1%)
Adhesiolysis n = 24	12 (50%)	10	6 (60%)	5 (50%)	1 (10%)	1 (8.3%)	1 (8.3%)
Polypectomy n = 9	5 (55.6%)	2	0	0	0	0	1 (20%)

series by Preuthippan and Herabutya in 2004 (10). Comparisons could not be made for metroplasty and endometrial resection since only one procedure was done in either category in our series.

For hysteroscopic myomectomy, the literature reports mean operating times ranging from 15 to 105 minutes (2, 3, 11–13) with most recommending a cut-off of 45 minutes to avoid fluid intravasation. The mean operating times in this series (87.03 ± 30.54 mins) may have contributed to the relatively higher rates of fluid intravasation. Several factors are likely to have impacted on the increased operating times. Optimal triaging of the patients, particularly with regards to the number, size, location and grading of the submucosal fibroids resected were not documented in most cases. These are recognized confounders affecting the operative time and risk of fluid intravasation. The depth of resection is directly related to the risk of fluid intravasation as progressively larger myometrial venous sinuses become involved.

All complications in our series occurred at myomectomy and were due to either excessive fluid intravasation or haemorrhage. These findings were similar to that reported by Propst *et al* (6) who reported higher complications with hysteroscopic myomectomy and metroplasty as compared to endometrial ablation and polypectomy. The only entry-related complication was the failure to dilate the cervix in one case. There was no entry-related uterine perforation, with a reported incidence of 0.7–0.8% (2) and 1.42% (4) of cervical trauma in this series. This is in disagreement with the findings of Jansen *et al* (13) who reported that more than half of

the complications of operative hysteroscopy were related to cervical entry. These findings may be attributed to the routine use of misoprostol for cervical priming in this series, resulting in less force being required for cervical entry.

Fluid-electrolyte disturbances are best prevented by stopping surgery when the fluid deficit is greater than 1500 mls so as to avoid adverse neurological, respiratory, cardiovascular sequelae or death resulting from Transurethral Resection of Prostate (TURP) syndrome (14). Hyponatraemia can cause generalized cerebral oedema, seizures and may be fatal. In this series, only biochemical evidence of hyponatraemia was experienced with no adverse clinical sequelae. Prevention requires meticulous attention to the fluid infusion rate, intrauterine pressure and fluid deficit. Other adjunctive measures shown to be of benefit in reducing fluid intravasation include the preoperative use of GnRH agonist by decreasing vascularity (15), intra-operative vasopressin causing vasospasm (16), the use of fluid irrigation systems for continuous monitoring of fluid deficit and choice of anaesthesia. Regional anaesthesia has been shown to reduce intravasation of fluid (7), as well as allow for earlier detection of central nervous system manifestations (apprehension, visual disturbances and agitation) which are normally masked by general anaesthesia (4).

Mannitol is associated with fewer neurological sequelae (17) as it is isotonic, allowing for the maintenance of the patient's osmolality. However, as it is electrolyte-free, it may still result in hyponatraemia and its sequelae.

Postoperative complications were minimal as demonstrated in other studies (2, 4, 6). There was no infectious morbidity, which may be attributed to the routine use of antibiotic prophylaxis and strict aseptic techniques.

Hysteroscopic resection of submucosal myoma was the most frequent procedure performed. Success is directly related to how much of the fibroid is intramural ((type 0–2), European Society of Hysteroscopy), its proximity to uterine serosa and its size. Pretreatment with a GnRH analogue was done in seven cases for submucous fibroids that were larger than 4 cm with all having a successful hysteroscopic myomectomy at first surgery. The beneficial effects of this treatment include reducing the myoma size, thickness of the endometrium and the vascularity of the fibroid resulting in less intra-operative bleeding and reduced risk of intravasation of the distension medium. Gonadotropin-releasing hormone therapy may decrease cervical compliance and has been reported to be associated with a four- to seven-fold increased risk of entry-related complications (6). This was not demonstrated in this study.

In the study, half of the patients who underwent myomectomies reported improvement in menorrhagia and dysmenorrhoea following the procedure. Success rates – defined as the absence of menorrhagia after hysteroscopic resection – had been reported in 80% of women (2). Vercellini *et al* (18) reported a three-year recurrence rate of 34% and a return of menorrhagia at three years of 30%. The results showed a 58.3% pregnancy rate and a 50% live birth rate following hysteroscopic myomectomy. These findings concurred with the literature, reporting cumulative pregnancy rates between 43% and 63%, as well as improved live birth rates (5). Seventy-two per cent of the patients were satisfied with the outcome of their surgery. Only two patients (6.3%) required a repeat procedure and one patient (3.1%) had a hysterectomy after hysteroscopic resection had failed to provide symptomatic relief.

Hysteroscopy has revolutionized the treatment of intra-uterine synechiae. The outcome of adhesiolysis in patients with Asherman's syndrome is dependent on the extent of the disease. In the study population, 50% of the patients reported resolution of amenorrhoea/hypomenorrhoea compared to findings in the literature of 88–98% of patients with menstrual irregularities resuming normal menstrual function (19, 20). A pregnancy rate of 60% and a live birth rate of 50% following hysteroscopic adhesiolysis were similar to the results reported in the literature with pregnancy rates from 32% to 87% (21). One half of the patients were satisfied with the outcome of their surgery.

Congenital müllerian duct abnormalities occur in 0.06% to 10% (22) of women and uterine septae accounts for 80–90%. Previously, the Jones and Tompkins metroplasties were first line treatment modalities (23, 24). These procedures require a laparotomy, a uterine incision and the attendant risk of secondary infertility due to adhesion formation. Hysteroscopic resection is now first line treatment for uterine

septae with anatomic and obstetric outcomes comparing favourably with the older and more invasive Jones and Tompkins techniques (23–25). A meta-analysis by Homer *et al* (26) reviewed 658 patients who collectively had a miscarriage rate of 88% prior to metroplasty. This rate was reduced to 14% after surgery.

Operative hysteroscopy is a safe and highly effective therapy for carefully selected women. As a consequence of technological advancements, an increasing number of gynaecological conditions, traditionally treated by laparotomy, can now be treated safely and effectively using outpatient operative hysteroscopy.

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